



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

THE APRIL MEETING OF THE IOWA SECTION.

The eighth regular meeting of the Iowa Section was held, in conjunction with the twenty-fifth annual meeting of the Iowa Academy of Science, at Simpson College, Indianola, on April 30, 1921.

The attendance was seventeen, including the following fifteen members of the Association:

Julia T. Colpitts, C. W. Emmons, M. E. Graber, E. C. Kiefer, G. E. King, F. M. McGaw, J. V. McKelvey, E. A. Pattengill, J. F. Reilly, H. L. Rietz, Maria M. Roberts, W. J. Rusk, B. F. Simonson, F. M. Weida, C. W. Wester.

The following officers were elected for the ensuing year: W. J. RUSK, Chairman; C. W. EMMONS, Vice-chairman; and J. F. REILLY, Secretary-treasurer. It was voted to accept the proposal of the Iowa Academy of Science that the Chairman of the Iowa Section become a member of the executive committee of the Academy, with a view to a closer coöperation of the two bodies. In accepting the proposal it was understood that the Iowa Section's independence, or relation to the Association, was in no way impaired.

Professor McKelvey's committee on the reports of the National Committee on Mathematical Requirements was continued.

The following papers were presented:

(1) "Correlation between mental tests and grades in mathematics of freshman engineering students" by Professor MARIA M. ROBERTS, Iowa State College;

(2) "Playing with the sine and projection formulas" by Professor W. J. RUSK, Grinnell College;

(3) "Certain summation formulas" by Professor J. F. REILLY, State University of Iowa;

(4) "Some properties of the function $w = \tanh z$ " by Mr. F. M. WEIDA, State University of Iowa;

(5) "Derived solutions of differential equations" by Professor M. E. GRABER, Morningside College;

(6) "The surface $z = \log_v x$ " by Professor C. W. EMMONS, Simpson College;

(7) "Circles mutually tangent and tangent to concentric circles at specific points" by Professor C. W. WESTER, Iowa State Teachers College;

(8) "A study of certain reports of the National Committee on Mathematical Requirements." Committee report by Professor J. V. MCKELVEY, Chairman.

Abstracts of papers follow below, the numbers corresponding to the numbers in the list of titles:

1. Professor Roberts reported on a study made of the college records of 337 freshman engineers who took the Thurstone engineering intelligence test. Correlations were found, first, between college mathematics and the first four tests, arithmetic, algebra, geometry and general intelligence; second, between college mathematics and the first three, arithmetic, algebra and geometry; and third,

between college and high school algebra. The correlation coefficients are found to be .40, .45 and .44, respectively, showing that the mathematics portion of the engineering test is as good a means of judging the possibilities of college freshmen in mathematics as any measure we now have. These tests are still in a formative state and will doubtless eventually be valuable to college authorities.

2. Professor Rusk gave (a) various proofs of the formulas for $\sin(\alpha \pm \beta)$, $\cos(\alpha \pm \beta)$, $\tan(\alpha \pm \beta)$; (b) proofs for the half-angle formulas; and (c) proofs for the Mollweide formulas, showing that they themselves are half-angle formulas.¹

3. Professor Reilly proved the summation formula

$$\begin{aligned} \frac{n!}{m!} \sum_m x(x-1) \cdots (x-m+n+1) \\ = \frac{(n+1)!}{(m+1)!} \sum_{m+1} x(x-1) \cdots (x-m+n+1) \\ + \frac{(n+2)!}{2!(m+1)!} \sum_{m+1} x(x-1) \cdots (x-m+n+2) \\ + \frac{(n+3)!}{3!(m+1)!} \sum_{m+1} x(x-1) \cdots (x-m+n+3) \\ + \cdots + \frac{(m+1)!}{(m-n+1)!(m+1)!} \end{aligned}$$

for $0 \leq n \leq m$, where $\sum_m x(x-1)(x-2) \cdots (x-n+1)$ denotes the sum of all the products containing n factors each that can be formed from the m factors $x, x-1, x-2, \cdots, x-m+1$, and where $\sum_m x(x-1) \cdots (x+k)$ equals 1, or 0, according as $k = 1$, or $k \geq 2$.

4. Professor Weida showed that the function $w = \tanh z$ is analytic, automorphic, single valued, continuous, and holomorphic, everywhere except at its poles. Among other things he discussed its zeros, its maximum and minimum values, and the mapping of the z -plane on the w -plane.

5. The usual course in introductory differential equations is concerned simply with the problem of formal integration and pays but little attention to the origin or development of the differential equations of physics and mechanics. In this paper Professor Graber developed the differential equations for mechanical and electrical vibrating systems, exhibiting the anatomy and structure of the equations as an aid in interpreting their solutions. A classification of linear differential equations with their derived solutions was then outlined and an abbreviated solution for the non-homogeneous linear differential equation in series form presented. The differential equations considered were all of the form $(d^n y/dx^n) + A_1(d^{n-1}y/dx^{n-1}) + \cdots + A_n y = X$ where $A_1, \cdots, A_n$, and X are functions of x , and their solutions were classified by the application of the principle that if $\phi(m, x)$ is a solution and n values of m are equal to a , then the first $(n-1)$ partial derivatives of $\phi(m, x)$ with respect to m are solutions when m is replaced by a after differentiation.

¹ See p. 443.

6. A model of this surface was exhibited by Professor Emmons as a guide to the study of its properties. The ranges of x and y considered were $x \geq 0$ and $y \geq 0$; z may vary from negative infinity to positive infinity. Various plane sections were studied and the points of discontinuity and singularity were investigated. A system of ruled surfaces, having the given surface as an envelope, was set up.

7. Given OA_1, OA_2 fixed radii of two circles c_1, c_2 , and O_1, O_2 as variable centers of two mutually tangent circles c_3, c_4 tangent to c_1, c_2 respectively at A_1, A_2 ; then O_1, O_2 will be the corresponding elements of a projective correspondence between the points of the lines OA_1 and OA_2 . The lines O_1O_2 will be tangents to a circle c_5 tangent to OA_1 and OA_2 . The locus of the point of contact of circles c_3, c_4 is a circle, c_6 , concentric with c_5 and passing through A_1 and A_2 . Professor Wester extended this result to non-concentric circles c_1, c_2 , and special cases were discussed.

B. F. SIMONSON, *Secretary-Treasurer*.

THE MAY MEETING OF THE KENTUCKY SECTION.

The fifth annual meeting of the Kentucky Section of the Mathematical Association of America was held at the University of Kentucky, Lexington, Ky., on May 7, 1921. The meeting consisted of one session with Professor H. H. DOWNING presiding.

The attendance was eighteen, including the following six members of the Association: P. P. BOYD, J. M. DAVIS, H. H. DOWNING, Elizabeth LeSturgeon, E. L. REES, C. H. RICHARDSON.

The members and guests were entertained at luncheon by Professor H. H. Downing, the retiring chairman of the Section. Professor C. H. RICHARDSON was elected chairman of the Section and Professor ELIZABETH LESTOURGEON, secretary. Upon the invitation of Professor Richardson, it was voted to hold the next meeting at Georgetown College.

The following papers were presented:

- (1) "Objective measurements of results of teaching mathematics" by Professor J. W. BRANSON, Centre College (by invitation);
- (2) "Geometric proof of a theorem concerning the roots of a quartic" by Professor E. L. REES, University of Kentucky;
- (3) "The influence of modern trends in education upon mathematics as a school subject" by Mr. H. M. YARBROUGH, Western Kentucky State Normal School (by invitation);
- (4) "The need and content of a course in commercial mathematics" by Professor C. H. RICHARDSON, Georgetown College;
- (5) "History of arithmetic and algebra" (illustrated) by Dean P. P. BOYD, University of Kentucky.

Abstracts of the papers and discussions follow below, the numbers corresponding to the numbers in the list of titles: